

The Occurrence of Australian Echinoids in New Zealand Waters

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Abstract.

Clypeaster australasiae is recorded for the first time from New Zealand. The species *Holopneustes inflatus* and *Centrostephanus rodgersii*, though reported from New Zealand over fifty years ago, were subsequently deleted from the faunal list for lack of reliable evidence. Accurate localities are now given for specimens taken alive, and also for other material in unmacerated condition, with adherent spines and pedicellariae. The new evidence invalidates the theory recently proposed by H. L. Clark (1946) that New Zealand records of *Holopneustes inflatus* are attributable to dead material of Australian origin which has drifted across the Tasman Sea on floating kelp. All three species must be recognized as true members of the New Zealand fauna. Since two of them are also known from Lord Howe Island, their geographical range probably corresponds to the shallow water boundaries of the Tasman basin on its western, northern and eastern margins.

REGULARIA

Family DIADEMATIDAE

Genus **CENTROSTEPHANUS** Peters, 1855.

***Centrostephanus rodgersii* (A. Agassiz)**

1863. A. Agassiz, *Proc. Acad. Nat. Sci. Philadelphia*, 1863, p. 354.

Localities: Off Cavalli Islands, south of Whangaroa, in from 70 to 110 metres, two large specimens collected alive in July, 1949; also from Stephenson's Island, Whangaroa, several specimens collected about the year 1925 by the late W. La Roche, though apparently not hitherto placed on record. A specimen from each of these localities is in the Auckland Museum.

The dimensions of the Stephenson's Island example are as follows: Horizontal diameter of test, 97 mm.; height of test, 48 mm.; peristome, 38 mm.; apical system, 21 mm.; longest spines, 45 mm.; number of plates to each column, A 28, 1A 16. The largest specimen listed by Mortensen (1940) measures h.d. 95 mm., height 45 mm. However, the late H. L. Clark (1946) has recorded that Australian specimens reach 100 mm. h.d., or more.

The test is pale cream; the spines have the deep purple coloration characteristic of the species. The spines and skin of one of the Cavalli Island specimens are very strongly pigmented, approaching black.

C. rodgersii was first reported from New Zealand by Farquhar (1897) on the basis of a specimen in the then Colonial Museum; he was unable to cite the locality from which it was obtained, and stated that the specimen fell to pieces on its removal from its case. Hutton (1904) omitted the species from the *Index Faunae Novae Zealandiae*, but

Farquhar (1907) corrected this error. Mortensen (1921) again dropped the species from his revised list of New Zealand echinoids, and subsequently (1940) maintained this view. As the evidence for its New Zealand occurrence is now conclusive, the species must be restored to the faunal list. The geographical range of *C. rodgersii* as known so far comprises eastern Australia, Lord Howe Island and New Zealand.*

Family TEMNOPLEURIDAE

Genus HOLOPNEUSTES L. Agassiz, 1841.

Holopneustes inflatus Lütken

1872. Lütken, in A. Agassiz, *Bull. Mus. Comp. Zool.*, 3, 56.

This echinoid has recently been obtained in some numbers from the North Auckland peninsula, and as far south as Great Barrier Island. It is represented in a number of New Zealand collections. Auckland Museum possesses the finest specimen I have seen; it was taken at Houhora Heads in August, 1934, the depth not being recorded. It is of the *purpurescens* form (vide Mortensen, 1943), in perfect condition, and obviously alive when collected. It measures ca. 60 mm. h.d., and 40 mm. in height. The densely arranged spines measure individually up to 5 mm. in length, and are of a delicate, translucent mauve colour, paler at the distal extremity of each. The spines about the peristome are somewhat flattened, a feature which does not seem to have been reported in Australian specimens. Owing to the shortness of the spines, the tube-feet show up prominently as ten narrow, meridional bands, buff in colour, harmonising well with the mauve spines. This, indeed, must be one of the most beautiful sea-urchins of our fauna. The characters of the ambulacral plates, including the trigeminal arrangement of the pore-pairs, the occlusion of the lower element from the outer border of each amb-plate, and the tuberculation of the inter-amb plates, all correspond with published descriptions of Australian material.

Another large, but almost naked, test of 50 mm. h.d. was collected by A. W. B. Powell at Tryphena, Great Barrier Island, in ca. 30 metres. This carries a few spines and pedicellariae. Some 16 specimens, several with abundant spines and pedicellariae, were collected by Gladys Mumby from sandy beach at Doubtless Bay; these are in the Dominion Museum, and others from the same collector are in the museum of the Correspondence School, Wellington, and in the writer's collection.

H. inflatus was first recorded from New Zealand by A. Agassiz (1872), though omitted from the *Index* by Hutton (1904). This is surprising, since Hutton himself obtained a specimen (which he originally described as "*Echinus elevatus*" in 1872)—this specimen being still preserved in the Dominion Museum. Mortensen (1921) restored the species to the faunal list on the basis of a naked test taken by Bollons at Little Barrier Island, but subsequently (1943) he has treated the

* Since the above was written Mr. A. W. B. Powell obtained a living specimen from a trawl on the edge of the Centre Reef, Hauraki Gulf; 5½ miles S.E. of Little Barrier Island, 25-28 fathoms.

matter as uncertain. H. L. Clark (1946) regarded the occurrence of bare tests as providing no evidence of the species' occurrence, as he thought dead tests might be transported long distances on floating kelp. He concluded: "It is quite improbable that either *Amblypneustes* or *Holopneustes* lives in New Zealand seas."

The character of the material recorded above can leave no further grounds for maintaining such an opinion. The species is therefore to be retained on the faunal list. Its known geographical ranges comprise south and eastern Australia, Tasmania and New Zealand.

It is worthy of note that Farquhar (1926) recorded *Amblypneustes pachistus* (under the name *A. ovum* var. *pachistus*) from New Zealand. Since he is now proved correct in the cases of *C. rodgersii* and *H. inflatus*, there is strong reason to accept his report of *A. pachistus*.

IRREGULARIA

Family CLYPEASTRIDAE

Genus **CLYPEASTER** Lamareck, 1801.

Clypeaster australasiae (Gray)

1851. Gray, *Proc. Zool. Soc.*, 1851, p. 34.

Specimens recently dredged by A. W. B. Powell from 157 metres, off East Cape, and also off Parengarenga in from 70 to 90 metres, are all referable to this species. They are located in the Auckland Museum.

Australian specimens show considerable variation in the shape of the test, as discussed by Mortensen (1948), and a corresponding variation is apparent from the dimensions of the three New Zealand examples submitted to me.

Specimen.	Length.	Breadth.	Height.	Length of Spines.	
				Aboral.	Adoral.
A	116 mm.	104 mm.	32 mm.	3 mm.	1-2 mm.
B	99 mm.	90 mm.	32 mm.	3.5 mm.	1-2 mm.
C	92 mm.	84 mm.	23 mm.	3 mm.	1-2 mm.

Note.—Specimen C has a depressed apical region.

This is the second species of *Clypeaster* to be reported from New Zealand, and the first for which an accurate locality and depth is available. The other is *C. virescens* Doderlein, of which H. L. Clark (1925) recorded two specimens in the British Museum labelled "from off New Zealand (Terra Nova)." Bell (1917), in the official report on the *Terra Nova* echinoderms, had included no reference to such specimens.

KEY FEATURES.

To facilitate the recognition of any other specimens of these echinoids which may be obtained locally, the following characters may serve to distinguish them from other New Zealand species.

Centrostephanus rogersii is at once recognizable by its large, robust test, its long, tapering, hollow spines, and deep purple colour.

Holopneustes inflatus is characterized by its almost spherical test, rarely exceeding 50 mm. in diameter, and by its dense coating of numerous short, red, bristle-like spines. In the case of the form *purpureus*, the test may be larger, up to 70 mm. or so diameter, and the spines are mauve or purple. The large forms are more nearly hemispherical than the smaller ones.

The two species of **Clypeaster** are superficially similar; both are flattened shield-urchins, of oval or sub-pentagonal outline, with the aboral surface raised sub-conically, and bearing five petaloid ambulacra with the pore-series distally unclosed. **C. australasiae** has a concave lower surface, and 6-9 tubercles occur on each transverse costa between pore-pairs, the tubercles of the more distal costae being arranged in double series, while those of the remainder are in single series. **C. virescens** has a more nearly flat adoral surface, and not more than four tubercles occur on each costa, always in single series.

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